

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method comprising the computer-implemented steps of:
while an XML processor is perform[[s]]ing a validation operation on an XML-based input stream, performing the steps of:
while validating a particular XML element in said XML-based input stream,
causing said XML processor to generate one or more messages that indicate how to process said particular XML element other than validating said particular XML element, by identifying one or more annotations that are associated with said particular XML element; and
responding to a request for information about said particular XML element by providing said one or more messages.
2. (Previously Presented) The method of Claim 1, further comprising the computer-implemented step of:
while said XML processor performs said validation operation on said XML-based input stream,
receiving a request for said one or more annotations;
wherein the step of causing said XML processor to generate one or more messages is performed in response to said request.
3. (Previously Presented) The method of Claim 2, wherein the step of receiving a request includes receiving a request via an application program interface through which information about said validation operation can be requested by an external application.
4. (Previously Presented) The method of Claim 1, wherein the step of causing said XML processor to generate one or more messages includes causing said XML processor to generate one or more messages that are transmitted in an output stream.

5. (Previously Presented) The method of Claim 1, wherein the step of causing said XML processor to generate one or more messages includes causing said XML processor to generate one or more messages before completion of said validation operation on said XML-based input stream.
6. (Previously Presented) The method of Claim 1,
wherein said validation operation includes performing a validation operation on said particular XML element of said XML-based input stream; and
wherein the step of causing said XML processor to generate one or more messages includes causing said XML processor to generate one or more messages that indicate how to process said particular XML element, only if said particular XML element is determined valid based on said validation operation on said particular XML element.
- 7-12. (Canceled)
13. (Currently Amended) A method comprising the computer-implemented steps of:
while performing a validation operation on an XML-based input stream, performing the steps of:
receiving a request for information about the state of said validation operation;
and
responding to said request by providing said information about said state of said validation operation;
wherein said information about said state of said validation operation comprises one or more of:
the name of a node currently being processed;
the data type of the node currently being processed;

the current validation mode for the node currently being processed, wherein
the current validation mode is one of strict mode, lax mode, and skip
mode;
the current state of said validation operation; and
annotations that are associated with the node currently being processed.

14. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request regarding whether a first element of said XML-based input stream is defined in corresponding information that dictates the structure of XML data.
15. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request regarding what data type definition is associated with first element of said XML-based input stream, wherein said data type is defined in information that dictates the structure of corresponding XML data.
16. (Original) The method of Claim 15, wherein the step of receiving a request includes receiving a request regarding what data type definition is associated with an attribute of said first element, wherein said data type that is associated with said attribute is defined in said information that dictates the structure of corresponding XML data.
17. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request regarding whether a data type of content of first element of said XML-based input stream conforms to a corresponding data type definition in information that dictates the structure of corresponding XML data.
18. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request regarding a first annotation that is associated with first

- element of said XML-based input stream, wherein said first annotation is defined in information that dictates the structure of corresponding XML data.
19. (Original) The method of Claim 18, wherein said information that dictates the structure of corresponding XML data comprises a second annotation definition that is associated with a second element of said XML-based input stream, and wherein the step of receiving a request includes receiving a request regarding said second annotation, the method further comprising the computer-implemented step of: before responding to said request regarding said second annotation, responding to a request regarding whether said first element is defined in said information that dictates the structure of corresponding XML data.
20. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request regarding a status of said validation operation with respect to a first element of said XML-based input stream.
21. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request via an application program interface through which information about said validation operation can be requested by an external application.
22. (Original) The method of Claim 13, wherein the step of receiving a request includes receiving a request from an event handler sent in response to an event received in a parser output stream.
23. (Original) The method of Claim 13, wherein the step of responding to said request includes providing, in an output stream, said information about the state of said validation operation.

24. (Original) The method of Claim 13, further comprising the computer-implemented step of:
parsing said XML-based input stream only once for both of said validation operation
and operations that are dictated by annotations associated with elements in
said XML-based input stream.
25. (Original) The method of Claim 13, wherein information that dictates the
structure of corresponding XML data in said XML-based input stream, with which
said input stream is validated in said validation operation, comprises a plurality of
schema definitions that are associated with a plurality of corresponding XML
documents that could be constituent to said XML-based input stream.
- 26-38. (Canceled)
39. (Currently Amended) A computer-readable medium storing instructions for:
a validator that validates elements and attributes in an XML-based input stream
against information that dictates the structure of corresponding elements and
attributes, said validator comprising:
a state machine that responds to requests for information about validating a
first element in said XML-based input stream, while validating said
first element;
wherein said information about validating said first element comprises one or
more of:
the name of said first element;
the data type of said first element;
the current validation mode for said first element, wherein the current
validation mode is one of strict mode, lax mode, and skip
mode;

the current state of a validation operation currently being performed on
said first element; and
annotations that are associated with said first element.

40. (Currently Amended) The ~~system~~ computer-readable medium of Claim 39, wherein said state machine is able to respond to a request for information about an annotation associated with said first element, while validating elements or attributes in said XML-based input stream.
41. (Currently Amended) The ~~system~~ computer-readable medium of Claim 39, wherein said state machine is able to respond to a request that is responsive to an event in a parsed output stream that is based on said XML-based input stream.
42. (Previously Presented) The method of Claim 1, further comprising:
reading said annotations from metadata that corresponds to said XML-based input stream.
43. (Previously Presented) The method of Claim 1, further comprising:
reading said annotations from an XML schema that corresponds to said XML-based input stream.
44. (Previously Presented) The method of Claim 1, wherein the step of causing said XML processor to generate one or more messages includes causing said XML processor to generate one or more messages that indicate how to conform said specific elements to one or more requirements of an application that uses said specific elements.
- 45-47. (Canceled)

48. (New) A computer-readable storage medium storing one or more sequences of instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of:
while an XML processor is performing a validation operation on an XML-based input stream, performing the steps of:
while validating a particular XML element in said XML-based input stream,
causing said XML processor to generate one or more messages that indicate how to process said particular XML element other than validating said particular XML element, by identifying one or more annotations that are associated with said particular XML element; and
responding to a request for information about said particular XML element by providing said one or more messages.
49. (New) The computer-readable storage medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:
while said XML processor is performing said validation operation on said XML-based input stream,
receiving a request for said one or more annotations;
wherein the instructions that cause said XML processor to generate one or more messages are performed in response to said request.
50. (New) The computer-readable storage medium of Claim 49, wherein the instructions that cause the one or more processors to perform the step of receiving a request includes instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request via an application program interface through which information about said validation operation can be requested by an external application.

51. (New) The computer-readable storage medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of causing said XML processor to generate one or more messages includes instructions which, when executed by the one or more processors, cause said XML processor to generate one or more messages that are transmitted in an output stream.
52. (New) The computer-readable storage medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of causing said XML processor to generate one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate one or more messages before completion of said validation operation on said XML-based input stream.
53. (New) The computer-readable storage medium of Claim 48, wherein said validation operation includes performing a validation operation on said particular XML element of said XML-based input stream; and wherein the instructions that cause the one or more processors to perform the step of causing said XML processor to generate one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate one or more messages that indicate how to process said particular XML element, only if said particular XML element is determined valid based on said validation operation on said particular XML element.
54. (New) A computer-readable storage medium storing one or more sequences of instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of:
while performing a validation operation on an XML-based input stream, performing the steps of:

receiving a request for information about the state of said validation operation;
and
responding to said request by providing said information about said state of
said validation operation;
wherein said information about said state of said validation operation comprises one
or more of:
the name of a node currently being processed;
the data type of the node currently being processed;
the current validation mode for the node currently being processed, wherein
the current validation mode is one of strict mode, lax mode, and skip
mode;
the current state of said validation operation; and
annotations that are associated with the node currently being processed.

55. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by one or more processors, cause the one or more processors to perform the step of receiving a request regarding whether a first element of said XML-based input stream is defined in corresponding information that dictates the structure of XML data.
56. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by one or more processors, cause the one or more processors to perform the step of receiving a request regarding what data type definition is associated with first element of said XML-based input stream, wherein said data type is defined in information that dictates the structure of corresponding XML data.

57. (New) The computer-readable storage medium of Claim 56, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding what data type definition is associated with an attribute of said first element, wherein said data type that is associated with said attribute is defined in said information that dictates the structure of corresponding XML data.
58. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding whether a data type of content of first element of said XML-based input stream conforms to a corresponding data type definition in information that dictates the structure of corresponding XML data.
59. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding a first annotation that is associated with first element of said XML-based input stream, wherein said first annotation is defined in information that dictates the structure of corresponding XML data.
60. (New) The computer-readable storage medium of Claim 59, wherein said information that dictates the structure of corresponding XML data comprises a second annotation definition that is associated with a second element of said XML-based input stream, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more

- processors, cause the one or more processors to perform the step of receiving a request regarding said second annotation, and wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:
- before responding to said request regarding said second annotation, responding to a request regarding whether said first element is defined in said information that dictates the structure of corresponding XML data.
61. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding a status of said validation operation with respect to a first element of said XML-based input stream.
62. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request via an application program interface through which information about said validation operation can be requested by an external application.
63. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of receiving a request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request from an event handler sent in response to an event received in a parser output stream.
64. (New) The computer-readable storage medium of Claim 54, wherein the instructions that cause the one or more processors to perform the step of responding to said

- request include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of providing, in an output stream, said information about the state of said validation operation.
65. (New) The computer-readable storage medium of Claim 54, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of: parsing said XML-based input stream only once for both of said validation operation and operations that are dictated by annotations associated with elements in said XML-based input stream.
66. (New) The computer-readable storage medium of Claim 54, wherein information that dictates the structure of corresponding XML data in said XML-based input stream, with which said input stream is validated in said validation operation, comprises a plurality of schema definitions that are associated with a plurality of corresponding XML documents that could be constituent to said XML-based input stream.
67. (New) The computer-readable storage medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of: reading said annotations from metadata that corresponds to said XML-based input stream.
68. (New) The computer-readable storage medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of: reading said annotations from an XML schema that corresponds to said XML-based input stream.

69. (New) The computer-readable storage medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of causing said XML processor to generate one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate one or more messages that indicate how to conform said specific elements to one or more requirements of an application that uses said specific elements.